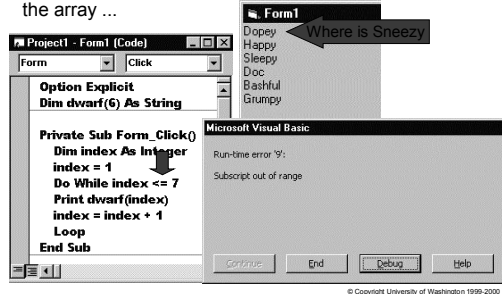




## FIT 100 Combining Indexing, Arrays, Loops

- ❖ A common error is to index beyond the end of the array ...



## FIT 100 Mini-Exercise #1

- ❖ Declare a variable that holds 20 doubles (i.e. numbers with a decimal place) that represent weights.

## FIT 100 Mini-Exercise #1 -- Answer

- ❖ Declare a variable that holds 20 doubles (i.e. numbers with a decimal place) that represent weights

```
Dim weights(19) As Double
```

## FIT 100 Mini-Exercise #2

- ❖ Initialize the array weights with values of 100, 200, 300, ... 2000

## FIT 100 Mini-Exercise #2 -- Answer

- ❖ Initialize the array weights with values of 100, 200, 300, ... 2000

```
Dim weights(19) As Double  
Dim i As Integer  
i = 0  
Do While i < 20  
weights(i) = (i + 1) * 100  
i = i + 1  
Loop
```

## FIT 100 Mini-Exercise #3

- ❖ Print out the contents of the array of weights

## **FIT 100** Mini-Exercise #3 -- Answer

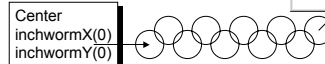
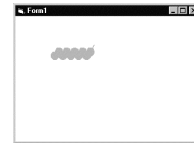
Print out the contents of the array of weights

```
Dim i As Integer
i = 0
Do While i < 20
  Print weights(i)
  i = i + 1
Loop
```

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## **FIT 100** Practice Using Arrays

- ❖ Draw a 10-segment "inch worm" on the screen and move it forward
- ❖ Use arrays to keep the positions of the segments
- ❖ Write procedures to initialize worm and draw it
- ❖ Goals of exercise:
  - Practice with arrays
  - Practice with indexing
  - Practice writing procedures
  - Notice how arrays are passed as parameters



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## **FIT 100** Worm code

- ❖ The code for this example is available on the class web under "Example Code"

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## **FIT 100** Worm Programming – Global Variables

- ❖ The first step is to declare two arrays. These hold the x and y coordinates of the center of each of the circles that make up the body of the worm.

There are 10 circles in all.

```
Dim inchwormX(9) As Integer, inchwormY(9) As Integer
```

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## **FIT 100** Worm Programming – Initialization

- ❖ Initialize the worm on Form load:

```
Private Sub Form_Load()
  FillColor = vbGreen
  FillStyle = 0
  Call initializeWorm(inchwormX(), inchwormY())
  Call drawWorm(inchwormX(), inchwormY())
End Sub
```

*(small) new concept: using a color constant vbGreen instead of rgb(0,255,0)*

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## **FIT 100** initializeWorm procedure

```
Private Sub initializeWorm(xSeg() As Integer, ySeg() As Integer)
  Dim index As Integer
  index = 0 ' Index range 0 thru 9
  Do While index < 10 ' Process all array elements
    xSeg(index) = 1000 + 100 * index
    If (index Mod 2) = 0 Then ' Test of index odd/even
      ySeg(index) = 1000 ' Even segments
    Else
      ySeg(index) = 900 ' Odd segments
    End If
    index = index + 1 ' Move to next index
  Loop
End Sub
```

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## **FIT 100** drawWorm procedure

```
Private Sub segment(x As Integer, y As Integer)
    Circle (x, y), 100, vbGreen
End Sub

Private Sub drawWorm(x1() As Integer, y1() As Integer)
    Dim iterate As Integer
    Cls
    iterate = 0
    Do While iterate < 10
        Call segment(x1(iterate), y1(iterate))
        iterate = iterate + 1
    Loop
    Line (x1(9), y1(9))-(x1(9) + 100, y1(9) - 200), vbGreen
End Sub
```

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## **FIT 100** Making the worm crawl

```
Private Sub Form_Click()
    Dim index As Integer
    index = 0
    ' make the worm crawl 200 twips in the x direction
    Do While index < 10
        inchwormX(index) = inchwormX(index) + 200
        index = index + 1
    Loop
    Call drawWorm(inchwormX(), inchwormY())
End Sub
```

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